

FACT SHEET
FINAL AMENDMENTS TO AIR TOXICS STANDARDS FOR
COKE OVEN BATTERIES

ACTION

- On March 31, 2005, the Environmental Protection Agency (EPA) issued final amendments to reduce emissions of toxic air pollutants, or air toxics, from coke oven batteries. These amendments are the first of a series of emissions reductions requirements known as residual risk standards.
- Today's regulation amends one of 96 MACT regulations that require 174 industry source categories to eliminate 1.5 million tons per year of 188 toxic air pollutants. Congress listed these toxics air pollutants in the Clean Air Act.
- Across the industry, this rule will require reductions of allowable emissions from 11.3 tons per year (tpy) under the 1993 MACT to 9.8 tpy under today's amendments. This rule will ensure that the affected batteries do not increase their emission back to the levels allowed in 1993.
- The final amendments include more stringent requirements for certain processes at several coke oven batteries to address health risks remaining after implementing EPA's October 1993 air toxics emission standards called Maximum Achievable Control Technology (MACT) standards. The final amendments also include requirements for new or reconstructed coke oven batteries that reflect improvements in emission control practices that have occurred in the years since the 1993 MACT standards.
- The final amendments apply to coke oven emissions from nine batteries at five coke plants for which the 1993 MACT standard applied. There are approximately 14 other coke oven plants in the country that are not affected by this rule because they chose to install more stringent controls than the MACT called Lowest Achievable Emissions Reductions (LAER), beginning in 1993. Because these LAER batteries opted to reduce their emissions by more than the 1993 MACT required, they do not have to comply with today's rule until 2020.
- Today's final amendments apply to charging, leaks, and bypass stacks at coke oven batteries. Emissions from these processes occur at the start of the process of turning coal into coke, primarily as the coke ovens are heating up.
- Today's final amendments do not apply to the pushing and quenching processes at a battery. Emissions from this process occur as the coke is removed from the battery and cooled down. The pushing and quenching process is regulated under a 2003 MACT. EPA will make a risk-based determination whether additional emissions reductions are necessary from this process by 2011.

- Today's amendments limit visible emissions from the following emission points: charging, topside leaks, and door leaks.
- The final amendments require these batteries to meet more stringent emission limits using a combination of pollution prevention and work practices.
 - ▶ Allowable visible emissions from coke oven doors will be reduced from 5.5 to 4.0 percent for foundry coke batteries, and from 5.0 to 3.3 percent for other batteries.
 - ▶ Allowable visible emissions from topside port lids (covers placed over openings through which coal is charged to the oven) will be reduced from 0.6 to 0.4 percent.
 - ▶ Allowable visible emissions from offtake systems (piping systems that provide passage for raw coke oven gas) will be reduced from 3.0 to 2.5 percent.
- The final amendments related to the 8-year MACT review apply to charging emissions from new or reconstructed coke oven batteries and reflect changes that have occurred in emission control practices during the past 8 years. The final amendments establish emissions limits that apply to the control equipment for charging operations and an opacity limit for fugitive emission from the charging operation. These amendments do not apply to existing sources.
- Other final amendments add work practice requirements to supplement the current visible emissions limit for door leaks. These requirements are simply a revision of the 1993 MACT and apply to all nine batteries.
- Affected plants must comply with the new requirements within 90 days after publication of the final amendments in the *Federal Register*.
- Coke ovens convert coal to coke which is used to produce iron at steel mills and foundries. A coke oven battery consists of a group of ovens connected by common walls.
- Coke ovens emit a mixture of chemicals which are a combination of many organic compounds and metals. This mixture is called "coke oven emissions" and is listed as such in the Clean Air Act's list of toxic air pollutants.

HEALTH AND ENVIRONMENTAL BENEFITS AND COSTS

- Coke oven emissions include polycyclic organic matter, polynuclear aromatic hydrocarbons, benzene, and other air toxics that are associated with a variety of adverse health effects including cancers and disorders of the blood, central nervous system, and respiratory system.
- EPA estimates that approximately 4 million people reside within 30 miles of the batteries

affected by this rule. Of these 4 million people, approximately 500,000 have an estimated cancer risk greater than 1 in 1 million and approximately 70 of these having a risk greater than 100 in 1 million. These estimates assume that facilities emit at the allowable limits and that people are exposed for 70 years at their current place of residence. Actual emissions are lower, and people generally move several times during their lives. Therefore, actual risk levels will be lower. A risk of 100 in 1 million (10^{-4}) is ordinarily the upper bound of acceptability.

- After implementation of the residual risk standards, EPA estimates that fewer than 10 people may have a cancer risk greater than 100 in a million, and about 300,000 people may have a cancer risk greater than 1 in a million. The maximum individual risk (i.e., the individual most exposed) would be reduced from about 300 in a million to about 270 in a million. The differences in risk pre- and post-amendments are reflected in the table below.

Comparison of Estimated Risk Impacts after Implementation of Final Amendments to Coke Oven Battery Standards (Based on 70-year Exposure Duration and Rounded)

Parameter	Risk after Implementation of 1993 MACT	Risk after Implementation of 2005 Risk-Based and 8-year MACT Review Requirements
Maximum individual risk from the source with highest risk	300 in a million	270 in a million
Numbers of people at each of the following risk levels		
>1 in a million	500,000	300,000
>10 in a million	50,000	8,000
>100 in a million	70	<10
Total Modeled Population	4,000,000	4,000,000

- Most batteries are already achieving the emission limits these amendments require. For this reason, only small additional costs will be incurred by these batteries. The estimated cost for batteries not yet achieving the standards is about \$28,300 annually, and is attributable to monitoring, recordkeeping, and reporting requirements needed to ensure continuous compliance.
- Even though most existing facilities are already reducing emissions beyond the limits required by the 1993 regulation, the final amendments will ensure that environmental protection, beyond what is currently required, will be maintained.

EPA'S AIR TOXICS PROGRAM: TWO-PHASED REGULATORY APPROACH

- The Clean Air Act requires EPA to regulate air toxics from large industrial facilities in two-phases.
- The first phase is “technology-based,” where EPA develops standards for controlling the emissions of air toxics from sources in an industry group (or “source category”). These Maximum Achievable Control Technology (MACT) standards are based on emissions levels that are already being achieved by the better-controlled and lower-emitting sources in an industry. EPA finalized the coke ovens MACT standards for charging, topside leaks, and door leaks in October 1993.
- Within 8 years of setting the MACT standards, EPA is required to assess the remaining health risks from each source category to determine whether the MACT standards appropriately protect public health. Applying this “risk-based” approach called residual risk, EPA must determine whether more health-protective standards are necessary. These risk-based amendments to the 1993 MACT standards are being finalized today.
- To decide whether additional regulation under residual risk was necessary, EPA applied the two-step decision process described in the 1989 Benzene National Emissions Standards for Hazardous Air Pollutants. With this process EPA first determines if the risk to the individual most exposed is acceptable and then if the exposed population is protected with an ample margin of safety. This decision framework is further described in both the EPA’s Residual Risk Report to Congress (http://www.epa.gov/ttn/oarpg/t3/reports/risk_rep.pdf), and in the Air Toxics Risk Assessment Reference Library (http://www.epa.gov/ttn/fera/risk_atoxic.html).
 - ▶ The Agency determined that risks associated with the emission limits in the 1993 MACT for coke ovens to be acceptable after considering the maximum individual risk, the population risk distribution, the projected absence of noncancer effects, and the uncertainty in the risk assessment.
 - ▶ In the second step, we determined that the emissions limits required by the final rule provide an opportunity for additional control, are achievable and cost effective, and provide an ample margin of safety to protect the public’s health.
- Also, every 8 years after setting the MACT standards, the Clean Air Act requires that EPA review and revise them, if necessary, to account for improvements in air pollution controls and or prevention. Today’s action also finalizes amendments under this requirement.

EPA REGULATIONS FOR COKE OVEN FACILITIES:

- Coke oven plants have achieved dramatic reductions in air toxics emissions in the last 16 years.

- In response to a 1989 air toxics rule for benzene emissions from by-product recovery operations, plants reduced their emissions from approximately 29,000 tpy to 2,000 tpy.
- The 1993 MACT for charging, leaks, and bypass stacks at coke oven batteries has resulted in estimated coke oven emissions reductions from 1,800 tpy to about 100 tpy. However, 13 of the 30 coke plants that were operating in 1993 have permanently closed; consequently, emission reductions are likely to be even greater. In addition, many of the exiting batteries are achieving greater reductions than what the MACT required.
- In the 2003 MACT for pushing we estimated that coke oven emissions from this process would be reduced from 700 tpy to about 400 tpy.
- These three rules have reduced toxic air pollutant emissions by over 92 percent (from 31,500 tpy to 2,500 tpy).
- Today's rule for charging, leaks, and bypass stacks at coke oven batteries requires additional reductions and ensures that there will be no 'back-sliding' from the reductions achieved by the 1993 MACT.
- By 2011, EPA will conduct a risk-based evaluation and an 8-year MACT review of the pushing, quenching, and battery stacks at coke oven batteries. At that time we will determine if additional emissions reductions are necessary.
- By 2011, the risk-based evaluation will assess the risks from pushing and quenching using the 2-step process described above, which first determines the acceptable level of risk and then sets the standard to protect the public health with an ample margin of safety.

CLEAN AIR ACT REQUIREMENTS SPECIFIC TO COKE OVEN BATTERIES

- As required by the Clean Air Act, the 1993 standards for coke oven batteries included what EPA refers to as two "tracks" of technology-based standards. The Clean Air Act specified different compliance timetables depending on the track chosen by each facility owner. These tracks are referred to as the MACT track and the lowest achievable emissions rate (LAER) track.
- The coke oven batteries covered under the LAER track are those that voluntarily agreed to meet more stringent technology-based standards beginning in 1993. The LAER standards tighten over time with the final standards becoming effective in 2010. The LAER track batteries are not required to meet residual risk standards until 2020. Today's action does not set standards for LAER track batteries.

- The final limits for batteries on the MACT track will replace the less stringent 1993 limits and are equivalent to the limits that will become effective on January 1, 2010, for batteries on the LAER track.

FOR MORE INFORMATION

- To download a copy the final amendments, go to EPA's World Wide Web site at <http://www.epa.gov/ttn/oarpg> under newly proposed or issued rules.
- For further information about the final amendments, contact Mr. Steve Fruh of EPA's Office of Air Quality Planning and Standards at (919) 541-2837 or fruh.steve@epa.gov.